



White Paper for ETF & Indexing Investments USA 2011 Conference

Exploring the Potential of Precious Metals ETF's

In order to assess the potential of gold bullion ETF's to enhance long-term portfolio performance, the research team at Tacita Capital Inc. analyzed the long-term returns and volatility of gold (USD) and the correlation of gold's returns to inflation, the U.S. dollar, real bond yields and major asset classes. Our analysis included both historic and forward looking mean-variance optimization runs to explore gold's portfolio role in greater depth. Our focus is to ascertain the role of gold as a strategic asset in a portfolio.

Summary of Findings and Conclusions

1. Gold returns have lagged those of the major stock indices. Since President Nixon closed the U.S. gold window in 1971 and ended the gold exchange standard, gold had an annualized compound return of 9.4% as compared to the 10.2% and 10.4% returns of the S&P 500 and MSCI EAFE indices respectively. Gold has been a more volatile asset than large company stocks. Gold's annualized standard deviation of 23% compares to the 17.4% and 19.5% respective deviations of the S&P 500 and MSCI EAFE indices.

The return from gold has also been episodic. Prices skyrocketed from September 1971 to September 1980 generating a 36.1% annualized return that substantially surpassed stocks. From the 1980 peak, gold suffered a massive, prolonged drawdown of -61.8% finally hitting bottom in August 1999. This 227-month decline is nearly seven times longer than the 34-month drawdown of stocks in the Great Depression.

The higher volatility and prolonged drawdown for gold arises from its major investment shortfall. Its returns are solely derived from price changes; there is no income stream from interest or dividends to offset volatility or price declines when either supply/demand dynamics or investor sentiment move against it.

2. Gold acts an effective inflation hedge in periods of persistently high and escalating inflation. Absent other causal factors that drive gold's price upwards, stocks and real estate are likely better inflation hedges during periods of declining or low and stable inflation.
3. There is a clear and persistent inverse relationship between the fortunes of the U.S. dollar and the price of gold. From 1974 to 2010, the correlation between the annual price returns of gold and changes in the trade weighted exchange rate, a weighted



average of the foreign exchange value of the U.S. dollar against a subset of its major trading partners, was -0.32. Since its inception in February, 1973, the trade weighted exchange rate has fallen in aggregate 36 percent; the U.S. dollar's devaluation is likely a major factor in the rise of gold prices.

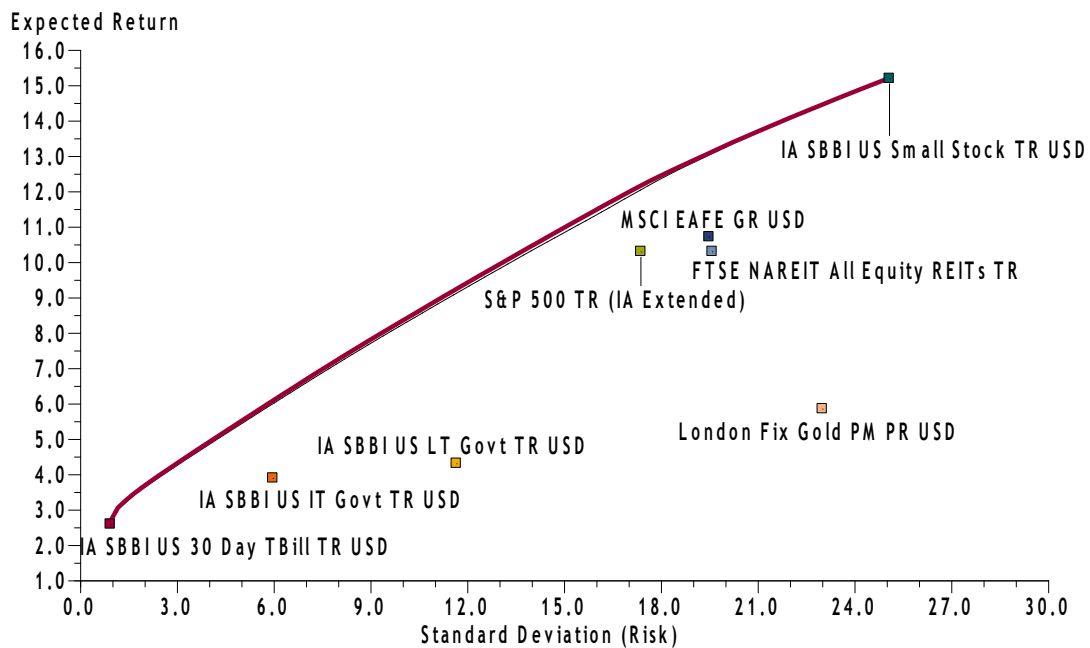
4. Gold prices appear to be strongly influenced by long-term, real (i.e. inflation adjusted) U.S. bond yields. From 1971 to 2010, the correlation between the annual returns from gold and real long-term bond yields was -0.67. The returns from gold were highest during the 1970's when bond investors chronically underestimated inflation rates and during the last decade when real interest rates have been atypically low.
5. Gold has acted as a hedge against tail risk events for both stocks and bonds. The relationship is particularly robust for stocks. Since the fall of 1971, during those quarters where the stock market lost 10% or more, gold earned an average return of 3.0%. Gold earned a positive return in 75% of these losing quarters and achieved a higher return than stocks in 92% of them.
6. Historically, gold has had a strong diversification effect within a portfolio. From September 1971 to March 2011, gold price returns had a 0.024 and -0.018 correlation with the returns of long-term government bonds and the S&P 500 respectively. Due to its negligible correlation with bonds and stocks, gold has the potential to improve the risk-adjusted performance of a portfolio. To illustrate this diversification effect, we ran a mean-variance optimization using the historic returns, standard deviations and correlations of stocks, bonds, real estate investment trusts and gold from September 1971 to March 2011. The resulting efficient frontier clearly demonstrated that gold historically improved the risk-adjusted performance of broadly diversified portfolios.
7. In our opinion, the return of gold over the past four decades is likely much higher than its long term expected return, looking forward from today. As a commodity, however unique, its long-term real return is most likely to be at or slightly above 0%. In fact, building on Professor Jeremy Siegel's historic investigations, we calculated that gold had a real return of only 0.66% per annum from 1802 to 2010.

Hence, in two sets of forward-looking mean-variance optimizations, we assumed the real, expected return of gold is 0% per annum - our base case - and 1.25% per annum - our growth case. These returns span the long-term historic number. The optimization inputs for all of the asset classes are set forth in Appendix II. The standard deviations and correlations are based on the experience of the last four decades. We assume inflation will be 2% per annum, consistent with current estimates.



In our optimization runs, we found that the inclusion of gold with an expected return of 0% does not improve the portfolio’s risk-adjusted returns at all. In essence, the low return and high volatility of gold offsets its low correlation benefits. Using the 1.25% annual real return assumption, our growth case, there is an improvement in risk-adjusted returns by including gold in a portfolio but it is very modest, in the range of 5 to 10 basis points. This illustrated in the following graph which compares the efficient frontier of the portfolio containing gold (in red) with the portfolio without gold (in black). They are virtually indistinguishable.

Efficient Frontier - Growth Case



In our opinion, where a decision is made to include gold as a strategic asset in a portfolio, it should not be based on gold’s ability to meaningfully improve long-term, risk-adjusted returns. Instead, a decision to include gold should be based primarily on its properties as a hedge against high levels of inflation, U.S. dollar devaluation, low real interest rates and tail risk. In general, we recommend strategic allocations to gold in a robustly diversified portfolio should not exceed 5% due to gold’s volatility, episodic performance and potential deep and lengthy drawdowns.

April 25, 2011

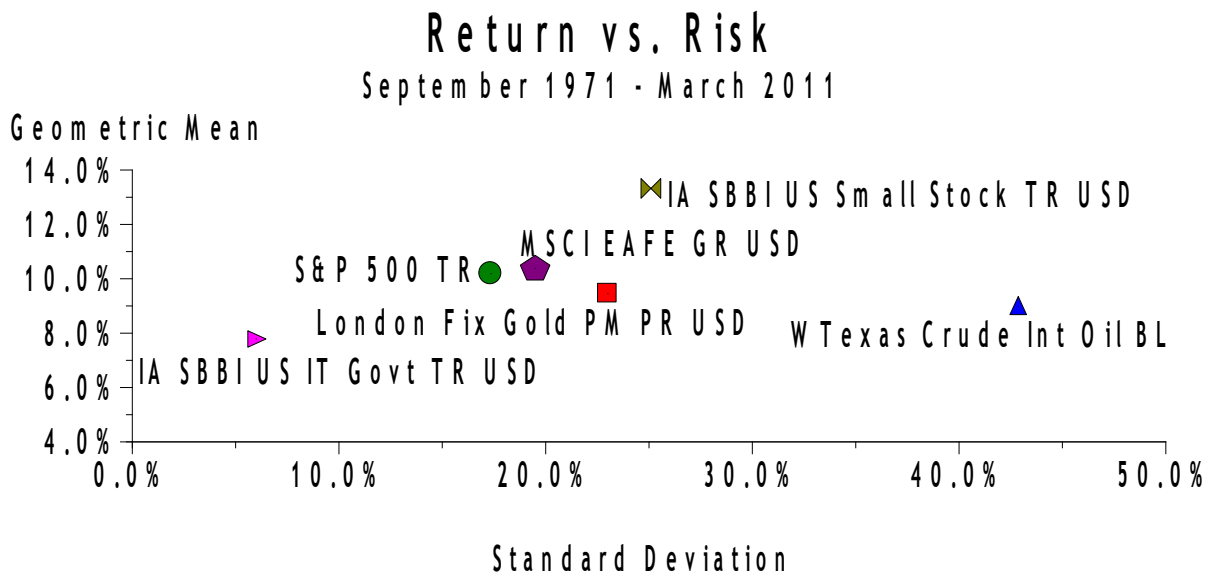
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Gold Bullion's Role in a Strategic Asset Mix

Historic Return Performance

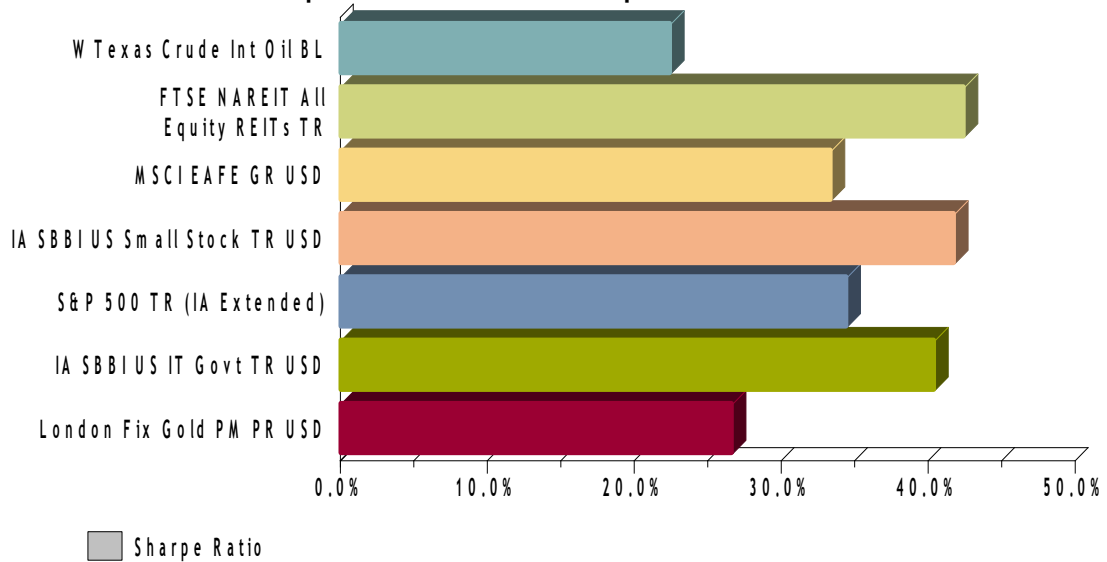
A meaningful analysis of gold starts in 1971 when President Nixon ended the last vestiges of the gold exchange standard that had backed currencies since the end of World War II. As illustrated in the following graph, from September 1971 to March 2011, gold (in red) had an annualized compound return of 9.4%, lagging behind the 10.2%, 10.4% and 13.3% returns of the S&P 500, MSCI EAFE and Ibbotson Small Stock indices respectively. Gold did outperform the 7.8% and 9.0% respective returns of intermediate government bonds and oil.



Gold's performance has been more volatile than domestic and international large company stocks. Gold's annualized standard deviation of 23% compares to the 17.4% and 19.5% respective standard deviations of the S&P 500 and MSCI EAFE indices. The returns of small company stocks and oil have been more volatile than gold. The 42.8% standard deviation of oil price returns is, in fact, nearly twice as volatile as that of gold price returns.

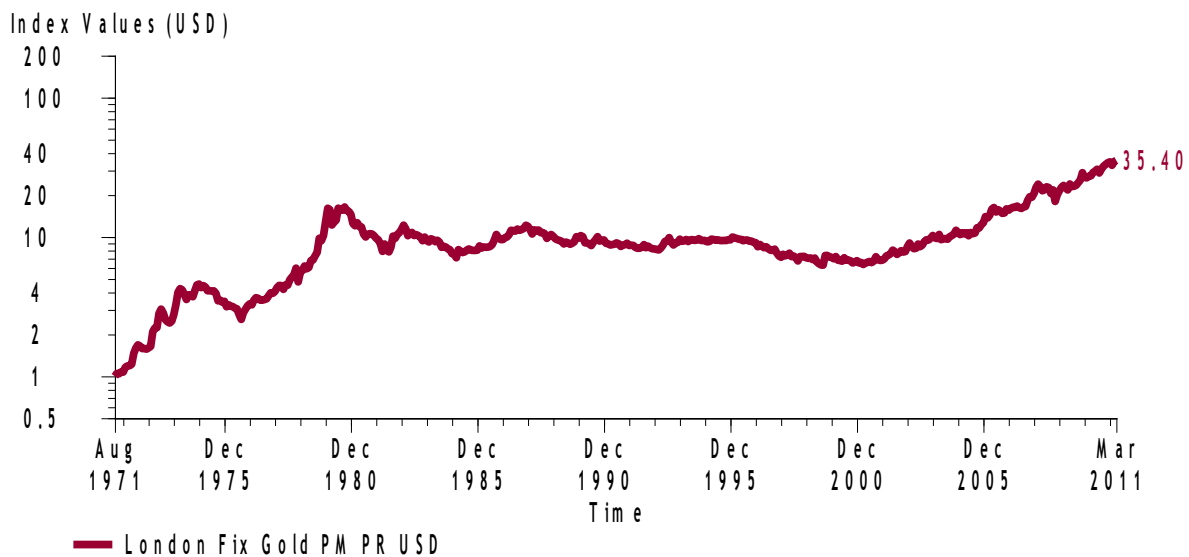
On the important reward-to-variability metric measured by the Sharpe ratio, gold ranked second last of all the major asset groups. Only oil has a poorer Sharpe ratio. Gold was also second last in Sortino ratio rankings, a reward-to-downside variability metric.

Sharpe Ratio Comparison



As illustrated in the following graph, the return from gold was episodic. Prices skyrocketed from September 1971 to September 1980 generating a 36.1% annualized return that massively surpassed stocks. The climb was far from straight up. During this period, gold had an annualized standard deviation of 42.6%, more than twice that of stocks. Investors needed strong stomachs to stay invested.

Cumulative Value





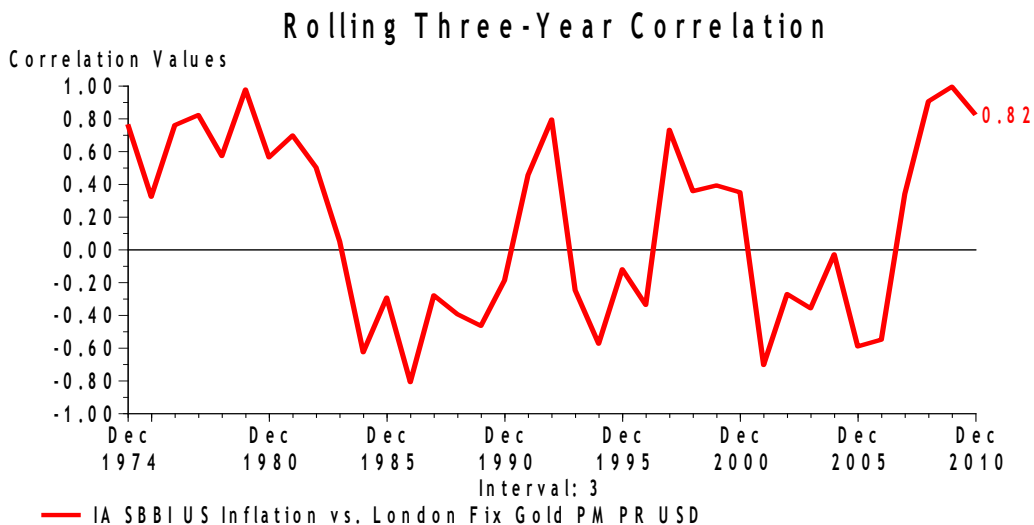
From the September 1980 peak, gold suffered a massive and prolonged drawdown of -61.8% over a 227-month period finally hitting bottom in August 1999. This decline took nearly seven times longer than the 34-month drawdown experienced by stocks in the Great Depression. Gold didn't fully recover its value until April 2007; a grinding round trip that took nearly twenty-seven years. Since then, however, gold has more than doubled in price.

The higher volatility and prolonged drawdown and recovery period for gold arises from its major investment shortfall. Its returns are solely derived from price changes; there is no income stream from interest or dividends to offset volatility or price declines when either supply/demand dynamics or investor sentiment move against it. Interestingly, absent the returns from dividends and their reinvestment, stocks historically suffered from a similar lengthy drawdown and recovery. The S&P 500 price index (i.e. excluding dividends) peaked in August 1929 and didn't fully recover until September 1954, a period of just over 25 years.

Gold and Inflation

In retrospect, gold had bloomed into an asset bubble in the 1970's. Inflation was clearly a catalyst. The correlation of annual inflation and gold price returns from 1971 through 1980 was 0.54. However, the moderate level of this correlation indicates that other factors were at work. Investor anxiety likely contributed to gold's rise. In addition to chronic inflation and ineffective monetary policy, the 1970's was a period of economic and social malaise characterized by energy shortages, lacklustre real economic growth and rampant disillusionment with government.

Over the entire forty-years from 1971-2010, the correlation of annual inflation and gold price returns was 0.48. However, as illustrated in the following graph, the relationship between gold prices and inflation is highly unstable.



It was only during the latter part of the 1970's when inflation was both persistently high and escalating that the correlation between gold returns and inflation was continually strong and positive. From January 1977 to gold's price peak in September 1980, the correlation between rolling 12-month gold returns and inflation was a very strong 0.88.

Gold's role as an inflation hedge comes to the fore in periods of persistently high and escalating inflation. Other assets classes such as stocks and real estate are likely better inflation hedges during periods of declining or low and stable inflation.

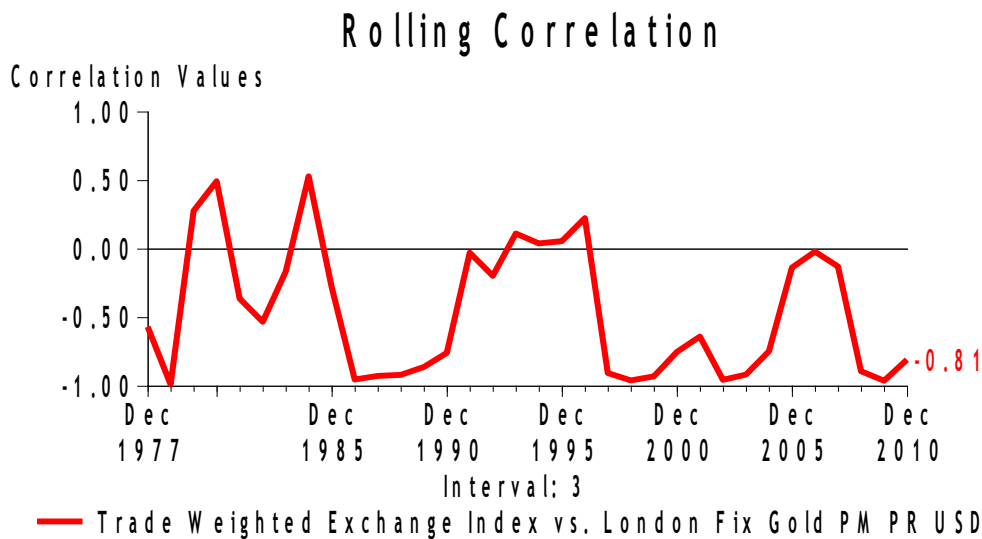
Gold and the Dollar

Under the Bretton Woods Agreements of 1944, the U.S. dollar became the world's *de facto* reserve currency. Foreign currencies were "pegged" to the American dollar, but only U.S. dollars were convertible into gold. Foreign central banks, however, could convert their American dollars into gold from the U.S. Treasury at a fixed rate of \$35 per ounce.

Starting in 1958 as the U.S balance of payments deficit increased, foreign central banks began exercising their convertibility rights exchanging U.S. dollars for gold. By 1971, declining U.S. gold reserves, an ever-growing money supply, escalating federal budget deficits and the onset of a trade deficit caused President Nixon to terminate the convertibility of the U.S. dollar into gold. It also signalled the end of the "pegged rate" foreign exchange regime that had existed under Bretton Woods so that by early 1973, most major currencies were floating.

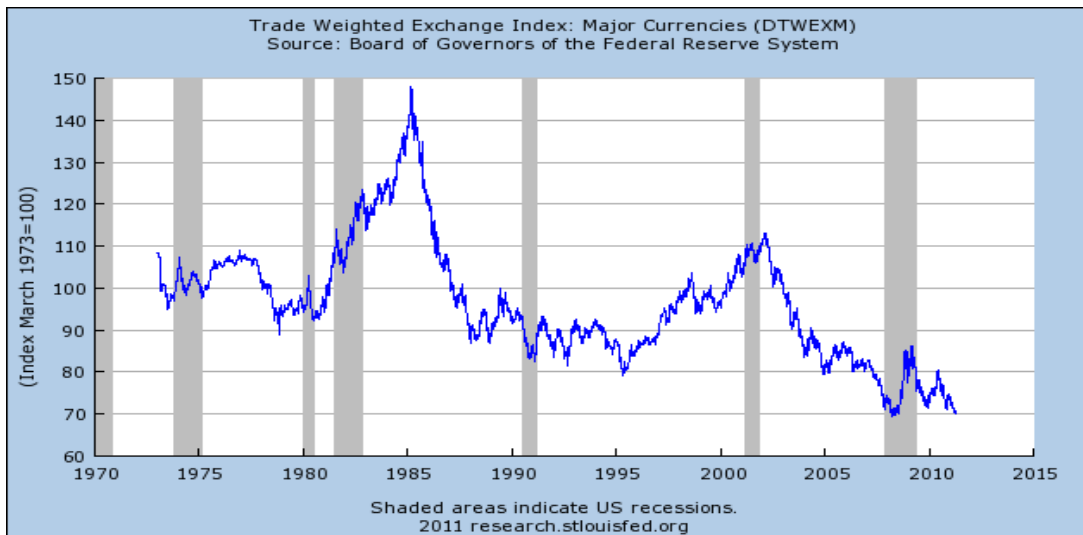


Since then, there has been an inverse relationship between the price of gold and the trade weighted exchange rate of the U.S. dollar. The trade weighted exchange rate is the weighted average of the foreign exchange value of the U.S. dollar against a subset of its major trading partners. From 1974 to 2010, the correlation between the annual price returns of gold and changes in the trade weighted exchange rate was - 0.32. The rolling three-year correlation is illustrated in the following graph.



What is particularly striking is how persistently negative the relationship has been. Only in a few periods such as the early 1990's when the exchange index stabilized did the correlation move into positive territory. Gold prices are clearly inversely related to the fortunes of the U.S. dollar.

As illustrated in the following graph, although there were periods of resurgence in the early 1980's and late 1990's, the overall trend in the trade weighted exchange index has been downwards over the past four decades.

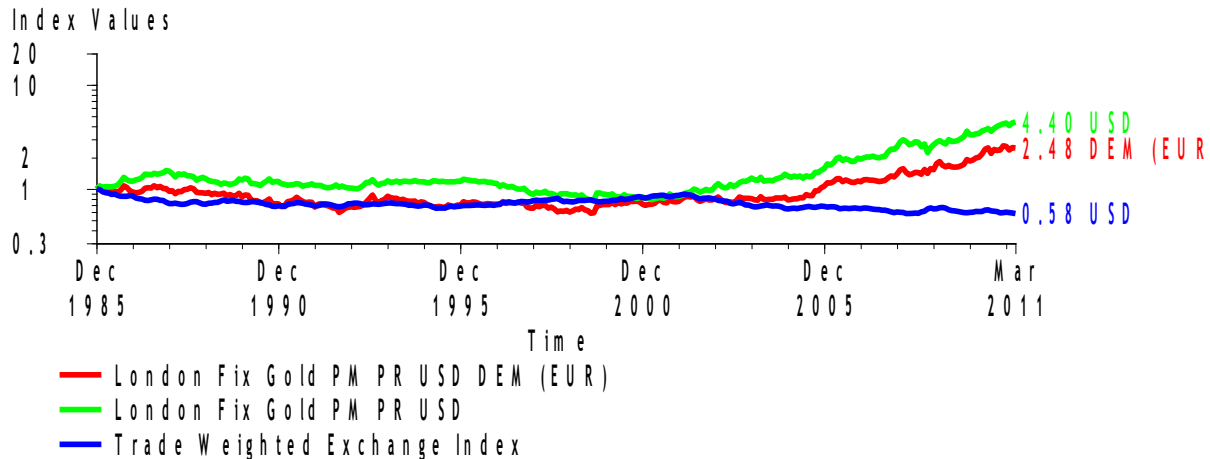


Economists have pointed to various causes for the devaluation of the U.S. dollar including chronic fiscal and trade deficits, continual domestic savings shortfalls and excessively low real interest rates. Although not unique to the U.S., these conditions clearly enhance gold's appeal as a hard currency and store of value.

In fact, when measured in stronger currencies such as the Deutschemark (and from 1999 onwards the Euro), gold has not provided near the same returns as it has to U.S. investors. From January 1986 through March 2010, gold as measured in Deutschemark/Euro terms had an annualized return of 3.7%; a dramatic reduction from the 6.1% return of U.S. denominated gold investments. The following graph illustrates the cumulative value of gold returns denominated in Deutschemarks/Euros versus U.S. dollars as well as the trade weighted index; it graphically portrays the influence of the devaluing dollar on enhancing U.S. denominated returns from gold.



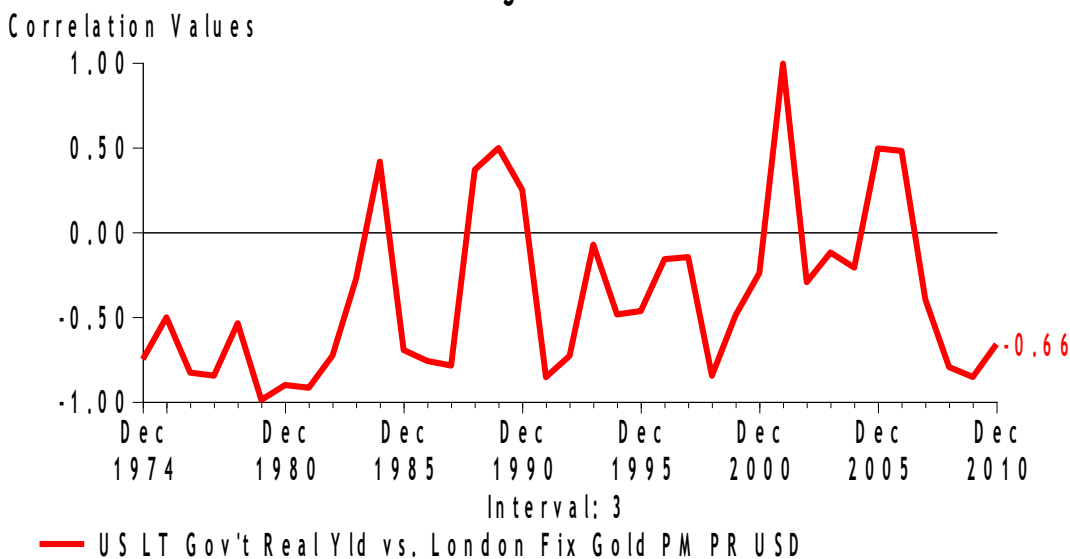
Cumulative Value



Gold and Real Bond Yields

Gold prices are strongly influenced by long-term real (i.e. inflation adjusted) U.S. bond yieldsⁱ. From 1971 to 2010, the correlation between the annual returns from gold and real bond yields has been -0.67. As illustrated in the following graph, this inverse correlation was strongest and most evident in the 1970's when real long-term bond yields were not only low but frequently negative.

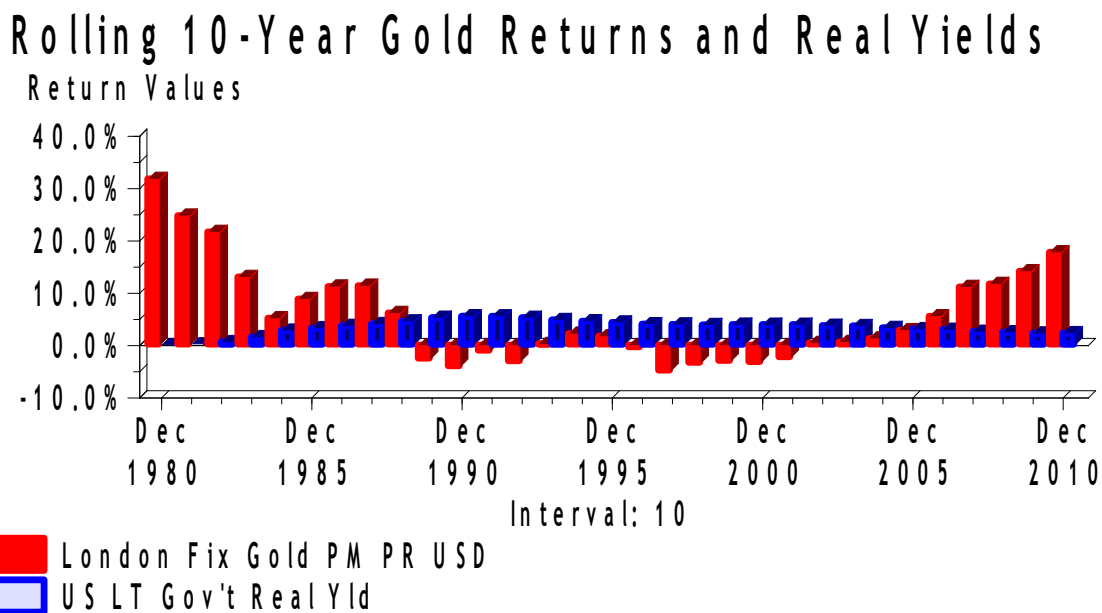
Rolling Correlation





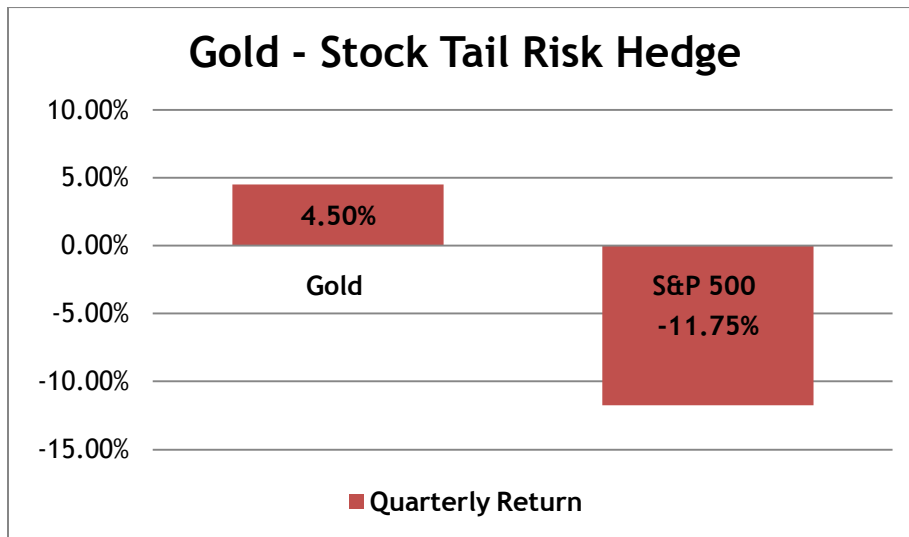
The correlation has also been strongly negative over the last several years. Unlike the 1970's, however, when inflation rates appear to have been chronically underestimated by bond investors, today's low real yields may reflect the global savings glut that was, at least in part, created by the recycling of U.S. dollars by China and other Asian countries back into Treasuries. The chronically undervalued currencies of those countries may be one of the primary contributors to today's low real yields and hence, the rise in the price of gold.

The following graph compares rolling 10-year annual gold returns to real yields. It clearly portrays the inverse relationship between gold returns and long-term real bond yields.



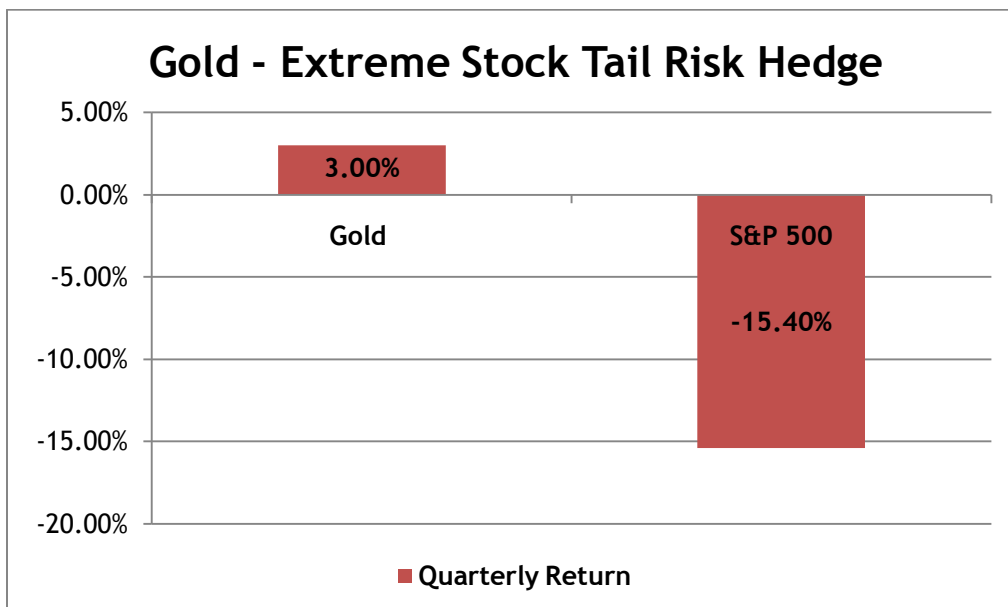
Gold as a Hedge against Tail Risk

Historically, gold has always acted as an asset of choice in times of economic distress and social unrest. Its unique history as an enduring store of value and medium of exchange supports its role as refuge during times of turmoil. The following graph compares the quarterly return of gold to the S&P 500, during quarters where the stock market declined by more than 5%.



During these losing quarters, stocks lost an average of 11.75% while gold earned an average 4.5% return. In fact, gold earned a positive return in 70% of the quarters where the market lost 5% or more and achieved a higher return than stocks in 87% of the quarters.

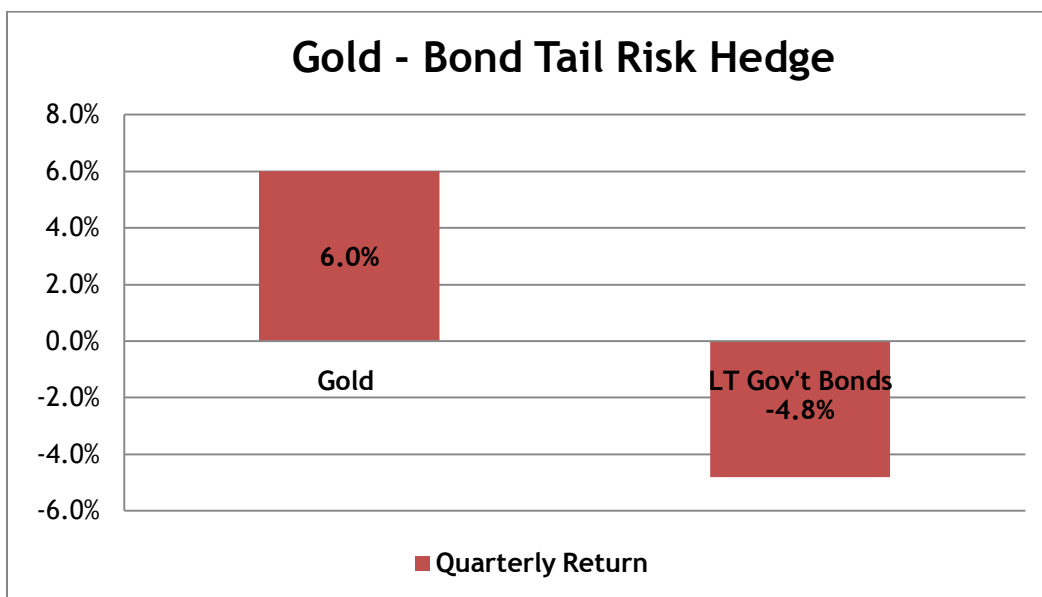
A similar picture of tail risk hedging occurs for quarters with more extreme losses. The following graph compares the quarterly return of gold to the S&P 500, during quarters where the stock market declined by 10% or more.





During the quarters where the market lost 10% or more, losing on average -15.4%, gold earned an average return of 3.0%. Gold earned a positive return in 75% of the quarters and achieved a higher return than stocks in 92% of the quarters.

Gold acts as a similar hedge against adverse performance by long-term government bonds. The following graph compares the quarterly return of gold to the Ibbotson long-term government bond index, during quarters where the bond market declined by 2% or more.



During the quarters where the long-term bonds lost 2% or more and on average lost 4.8%, gold earned an average 6.0% return. Relative to its hedging performance to stocks, gold is a less stable hedge against long-term bond performance. Gold earned a positive return in only 55% of the bond's losing quarters and achieved a higher return than bonds in 79% of these same quarters.

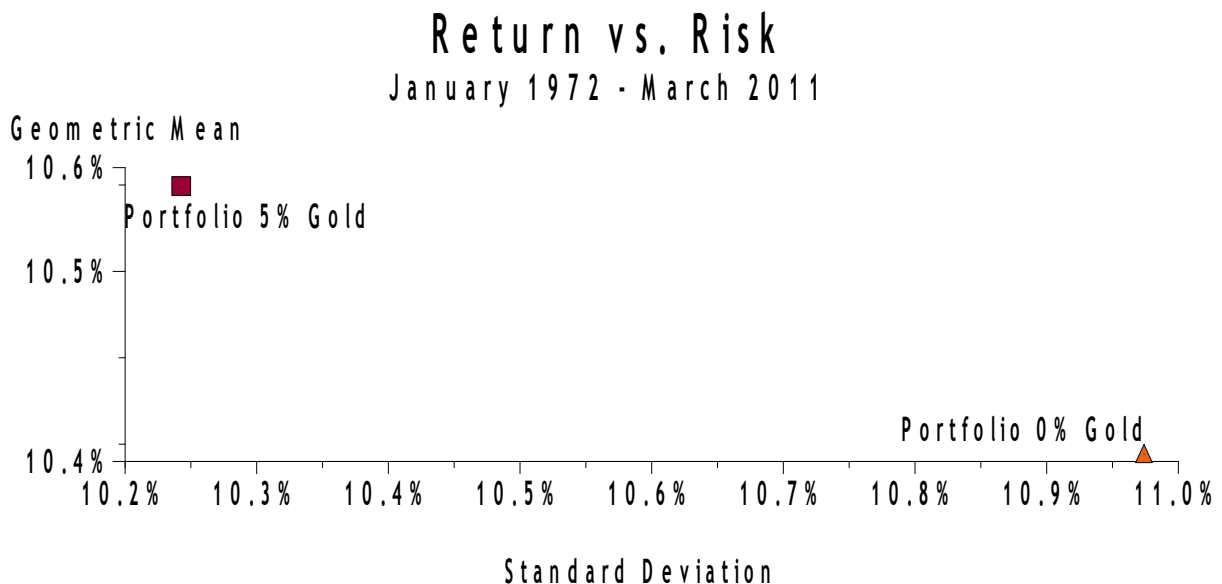
This hedging performance manifests itself in improved drawdown statistics for portfolios that contain gold. The following table compares the drawdowns of a diversified portfolio that contains no gold but is comprised of 5% cash, 15% intermediate term government bonds, 20% long-term government bonds, 40% large company domestic stocks, 10% small company stocks and 10% real estate investment trusts to a portfolio that contains 5% gold and 35% large company stocks but is equivalent in all other respects. The statistics include drawdowns in excess of 5% and is for the period January 1972 through March 2011. Both portfolios were rebalanced annually.



The portfolio with a 5% gold allocation experienced two fewer drawdowns with an average decline that was 55 basis points better than the portfolio without gold. Critically, the maximum decline drawdown that occurred from October 2007 to February 2009 was reduced by 331 basis points by allocating 5% to gold rather than large company stocks.

Drawdown Comparison						
	Number of Drawdowns	Average Decline (%)	Maximum Decline (%)	Average Mos. Decline Duration	Average Mos. Recovery Duration	Average Mos. Drawdown Duration
Portfolio with 5% Gold	14	-10.24	-26.91	6	6	12
Portfolio with 0% Gold	16	-10.79	-30.22	6	6	12

Finally, the superior drawdown performance of the portfolio with 5% gold was not at the expense of long-term performance, either absolute or risk-adjusted. As illustrated in the following graph, the portfolio with a 5% gold allocation achieved a slightly higher annualized return with slightly lower volatility.

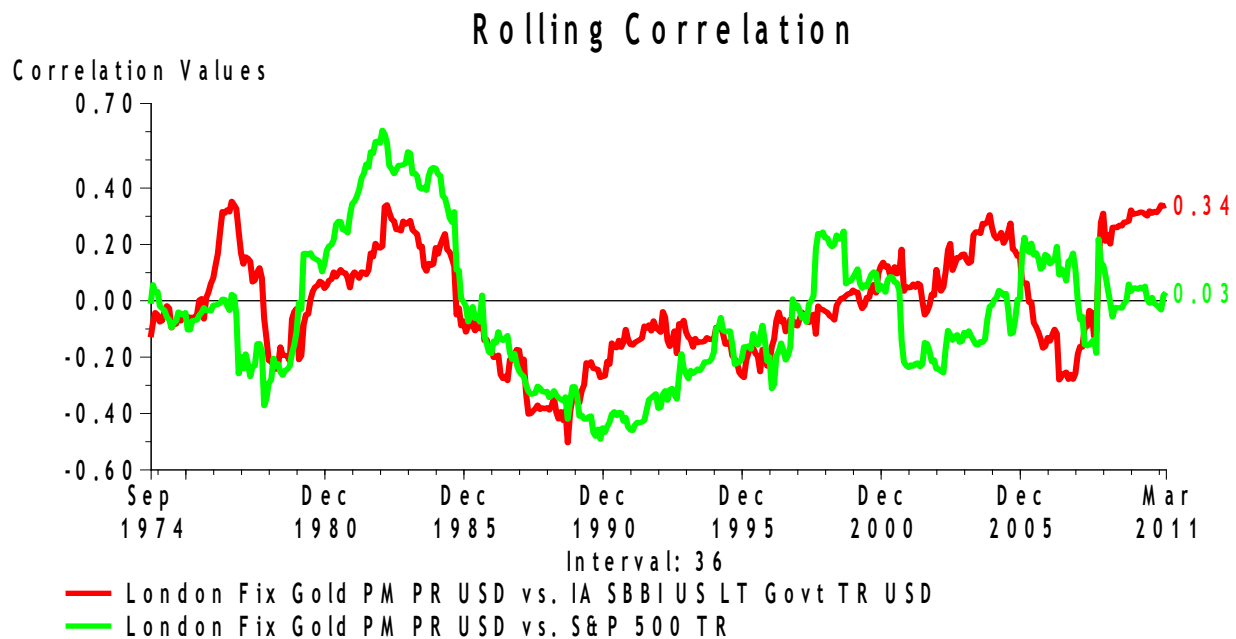




Portfolio Optimizations

One of the key rationales for including gold in a portfolio arises from its robust diversification properties relative to both bonds and stocks. From September 1971 to March 2011, gold price returns had a 0.024 and -0.018 correlation with the returns of long-term government bonds and the S&P 500 respectively.

Importantly, this correlation pattern has been relatively stable. The following graph depicts the rolling 36-month correlation between gold price return and the returns of long-term government bonds and the S&P 500 respectively. As can be seen, gold's correlation with both assets has typically ranged from moderately negative to moderately positive with considerable time spent at "nil to weak" correlation level.



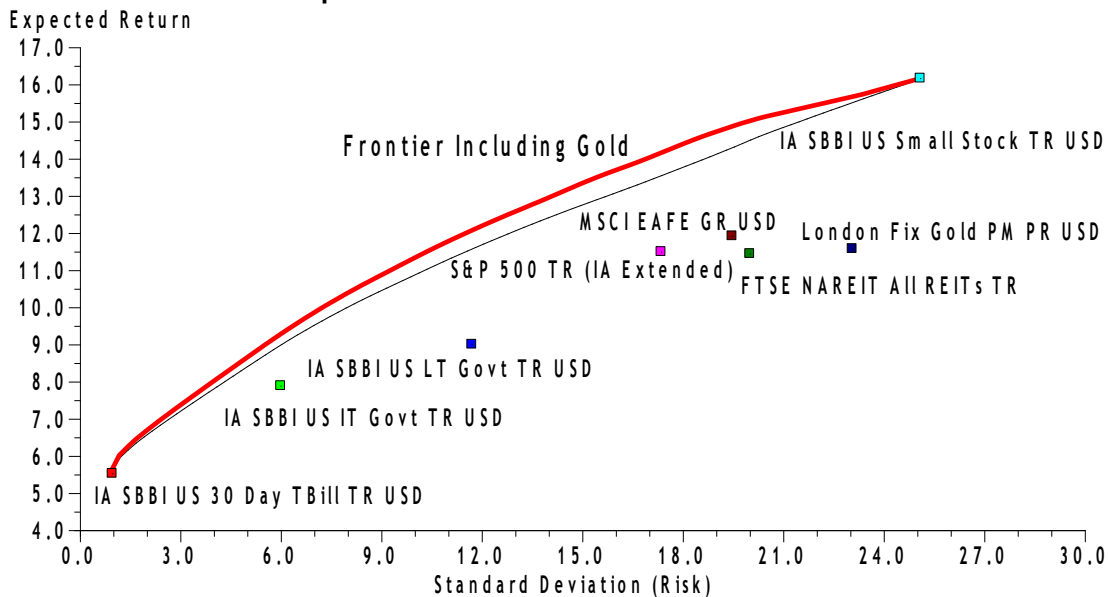
Only during the early 1980's when gold rallied in conjunction with bonds and stocks did gold's correlation with stocks and bonds move to strongly positive simultaneously.

Due to its negligible correlation with bonds and stocks, gold has the potential to improve the risk-adjusted performance of a portfolio. To illustrate this diversification effect, we ran a mean-variance optimization using the historic returns, standard deviations and correlations of stocks, bonds, real estate investment trusts and gold from September 1971 to March 2011. Our initial portfolio run excluded gold and represented a traditional portfolio comprised of bond, stocks and real estate. Our second optimization run added gold to assess whether gold could improve the risk-adjusted return profile of the portfolio.



The resulting efficient frontiers are illustrated in the following graph. The efficient frontier from the traditional asset mix is portrayed by the dark, thin line. The efficient frontier that also incorporates gold is in red.

Comparative Historic Frontiers



As can be seen, the portfolio that included gold was more efficient; it has higher risk-adjusted returns along the entire frontier. For further study, Appendix I details the asset composition of the more efficient, “gold included” portfolio.

Historic optimizations, although helpful in garnering insight into more efficient portfolio characteristics, are heavily influenced by the time period associated with the inputs. In these historic optimizations, the starting price of gold in September 1971 likely represents a “trough” price level due to restrictions on private ownership and the depressing effects of regulated “official” prices. The March 2011 price of gold, although not a peak price since it rose in April, is clearly some way along the price expansion curve. Hence, the historic nominal return of 9.4% likely overstates the long-term expected return of gold.

Also, the real return of gold over this period was 4.8% per annum. This seems far above a reasonable equilibrium level of price increases. Regardless of its unique role as a store of value and medium of exchange, gold is still a commodity the price of which is determined by supply and demand. It pays no dividends and unlike stocks, does not offer the prospect of



rising values based on productivity improvements that drive increased profitability. In comparison, the S&P 500 had a real price return (i.e. excluding dividends) of 2.3% per annum over the same time period.

Based on long-term historic numbers, the real return from gold has been modest. According to Jeremy Seigelⁱⁱ, the real value of a \$1.00 invested in gold in 1802 had grown to \$1.95 by the end of 2006. We updated these statistics through 2010 and it results in a real value of \$3.99 and a compound real return of 0.66% per annum. This is far below the 4.8% real return of the past four decades.

Hence, in our opinion, the return of gold in the historic optimization is in excess of the long-term expected return of gold. To better calibrate gold's portfolio role, we ran two forward looking optimizations. We used Ibbotson's building block methodology to derive expected arithmetic returns for the major asset classes.

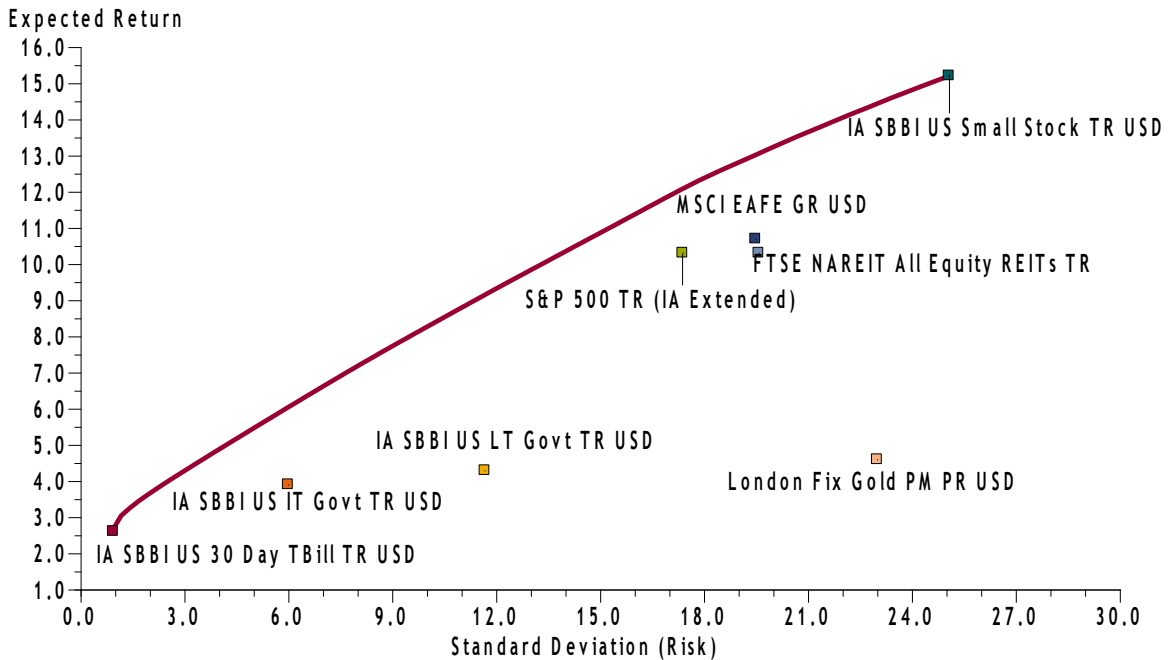
The expected return for gold in our first scenario called the "Base Case" is a geometric return of 2.0% per annum. This is approximately equivalent to the long-term expected inflation rate at this time; in other words, we assume an expected real return of 0.0% per annum. Our standard deviation and correlation inputs are based on the historic numbers from September 1971 to March 2011. All of our assumptions are set out in Appendix II.

We again ran two optimizations. Our initial portfolio run excluded gold and represented a traditional portfolio comprised of bonds, stocks and real estate. Our second optimization run added gold to assess whether gold could improve the risk-adjusted return profile of the portfolio.

The resulting efficient frontiers are illustrated in the following graph. As before, the efficient frontier from the traditional asset mix is portrayed by the dark, thin line. The efficient frontier that also incorporates gold is in red.



Efficient Frontier - Base Case



As can be seen, the efficient frontiers overlap one another. Unlike the historic optimizations, in this 0% real return scenario, the inclusion of gold does not offer the prospect of improved risk-adjusted returns, at least within the normal distribution framework of a mean-variance optimization analysis. The return and risk profile of any portfolio on the frontier that incorporates gold can be duplicated by an asset mix comprised only of more traditional assets.

In a scenario where gold achieves a negligible, long-term real return, the decision to include it in portfolio is not based on its ability to improve the efficiency of a portfolio. Instead, a decision to include gold is based on its properties as a hedge against high levels of inflation, U.S. dollar devaluation, low real interest rates and tail risk. Appendix III contains frontier area graphs that depict the asset compositions of both “optimal” portfolios, one without gold and one with gold. Conservative portfolios would have a maximum allocation to gold of 3% to 4% while balanced portfolios would have maximum allocations of 5% to 7%.

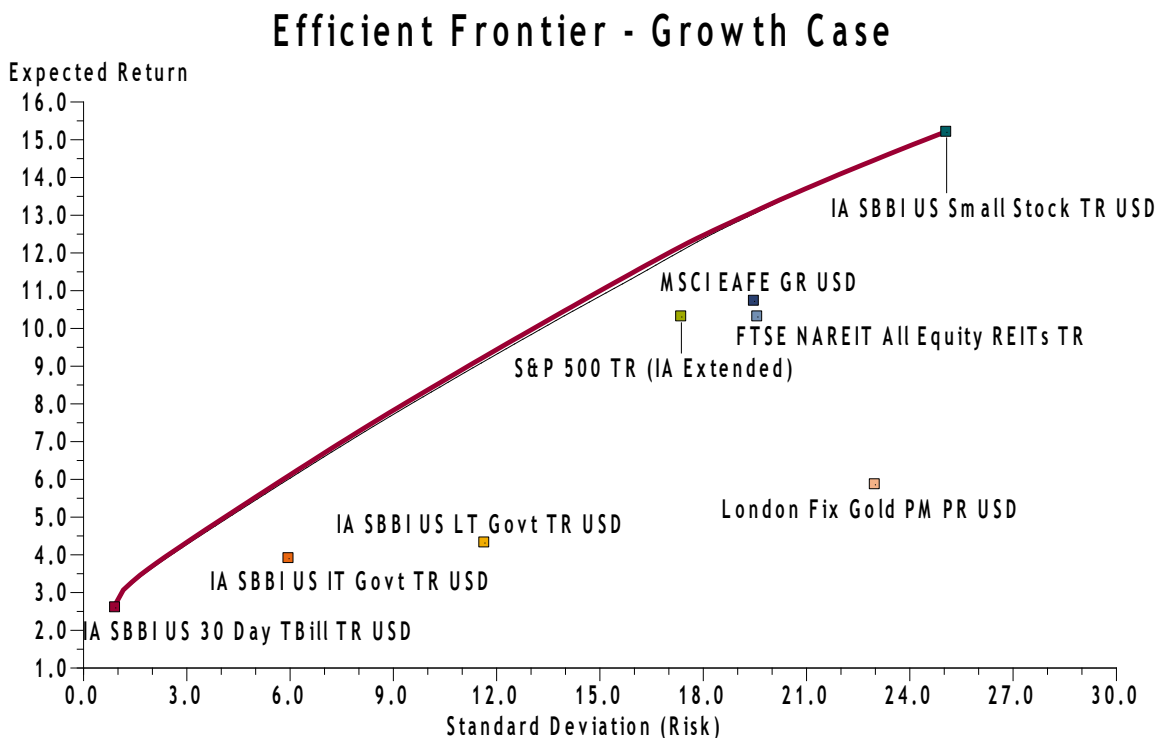
In our second scenario entitled the “Growth Case”, we assume a real return of 1.25% per annum for gold. Combined with an approximate 2.0% inflation rate, this is an expected geometric annual return of 3.25%. In this scenario, we are assuming a fundamental and continual shift in supply and demand dynamics due to rising replacement costs, increasing



emerging market demand and lasting concerns over sovereign debt, recurrently lax U.S. monetary policy and fiat currencies in general.

Relative to long-term historic numbers, this represents a bullish real growth rate. It is almost double the historic compound annual real return of 0.66%.

The resulting efficient frontiers for our “Growth Case” are illustrated in the following graph. As before, the efficient frontier from the traditional asset mix is portrayed by the dark, thin line. The efficient frontier that also incorporates gold is in red.



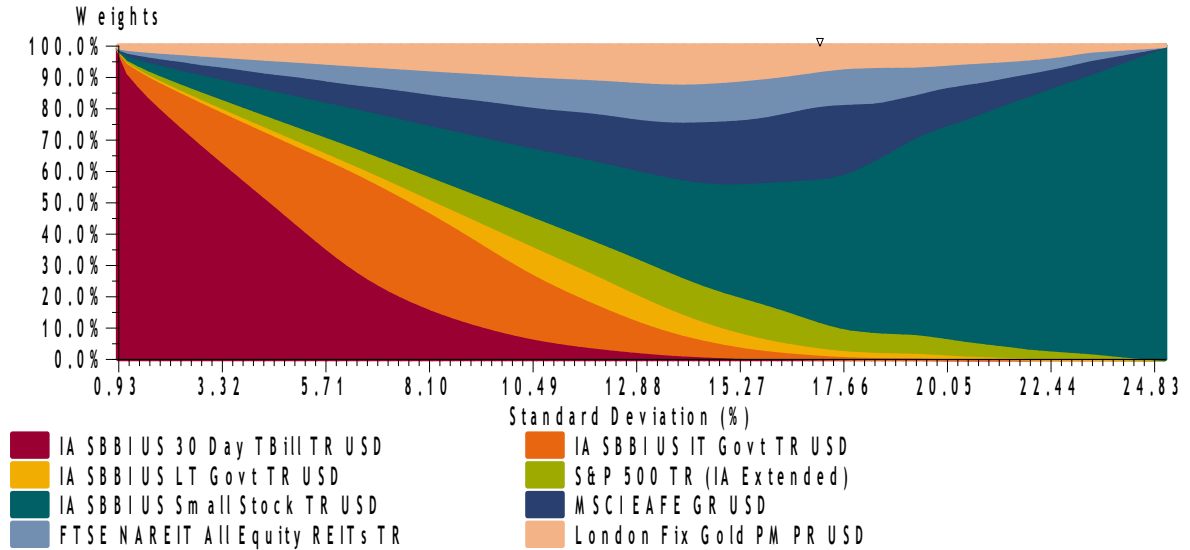
The portfolio that incorporates gold is only marginally more efficient; the frontier of the portfolio with gold barely rises above that of the traditional asset portfolio. The risk-adjusted return gains are quite small. Conservative portfolios that incorporate gold have a higher return of approximately 5 basis points while balanced portfolios have an incremental return of approximately 8 basis points. Aggressive portfolios have the highest incremental return in the range of 10 basis points.

The following frontier area graphs set out the asset compositions of the portfolio with gold as well as the more traditional mix without gold. In reviewing the frontier graph of the portfolio

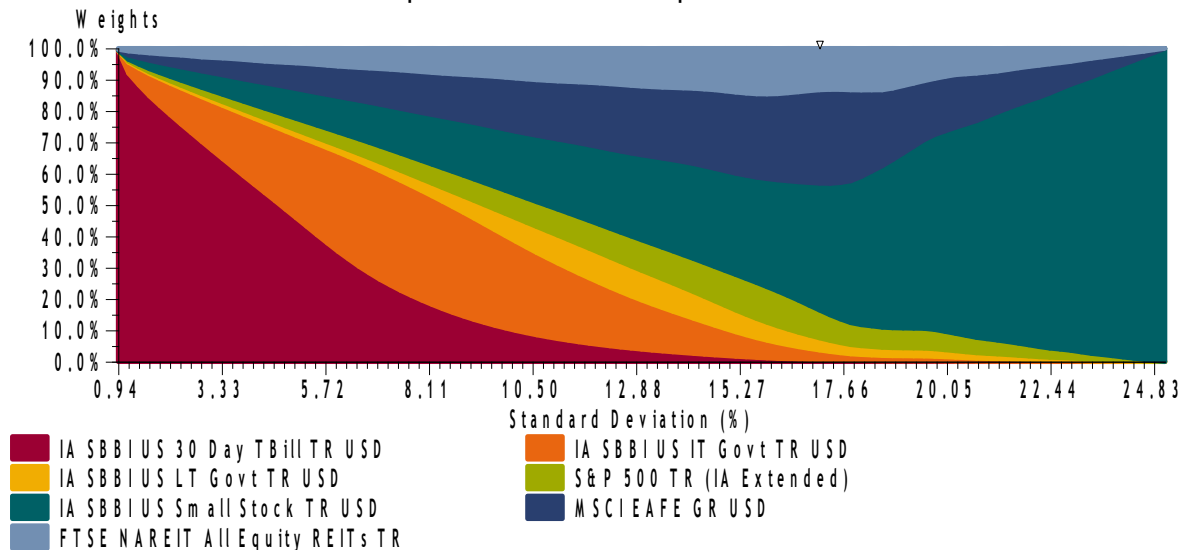


with gold, it can be seen that gold plays a minor role in efficient portfolio even when a reasonably bullish long-term return assumption is used.

Frontier Area Graph - Growth Optimization with Gold



Frontier Area Graph - Growth Optimization w/o Gold



In comparing the frontier area graphs, it can be seen that including gold in a portfolio tends to reduce the allocation to other, more diversifying asset classes including cash, real estate investment trusts and international stocks. This is an important facet of designing portfolios with gold as a strategic asset. The greater the number of diversifying assets included in a



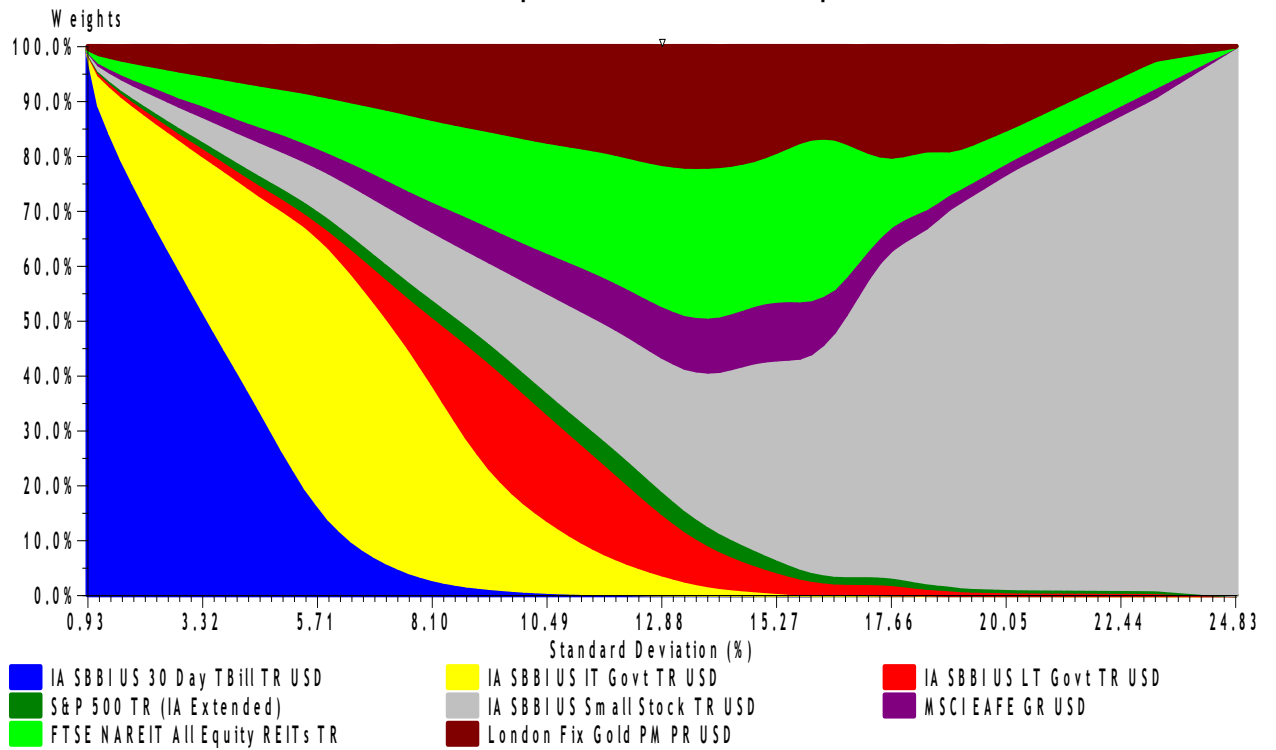
portfolio such as commodities, emerging market stocks and Canadian stocks, the more reduced the role of gold from a mean-variance optimization perspective. In fact, in optimization runs that we have done that are not shown here and that incorporate commodities, emerging market funds and hedge funds, the allocation to gold drops to low to mid-single digit percentage levels.

Based on these optimization results, in our opinion, the decision to include gold as a strategic asset in a portfolio should not be based on its ability to meaningfully improve long-term, risk-adjusted returns. Instead, the decision to include gold should be based primarily on its properties as a hedge against high levels of inflation, U.S. dollar devaluation, low real interest rates and tail risk. In general, we recommend strategic allocations to gold in a robustly diversified portfolio should not exceed 5% due to gold's volatility, episodic performance and potential deep and lengthy drawdowns.



Appendix I

Frontier Area Graph - Historic Optimization





Appendix II

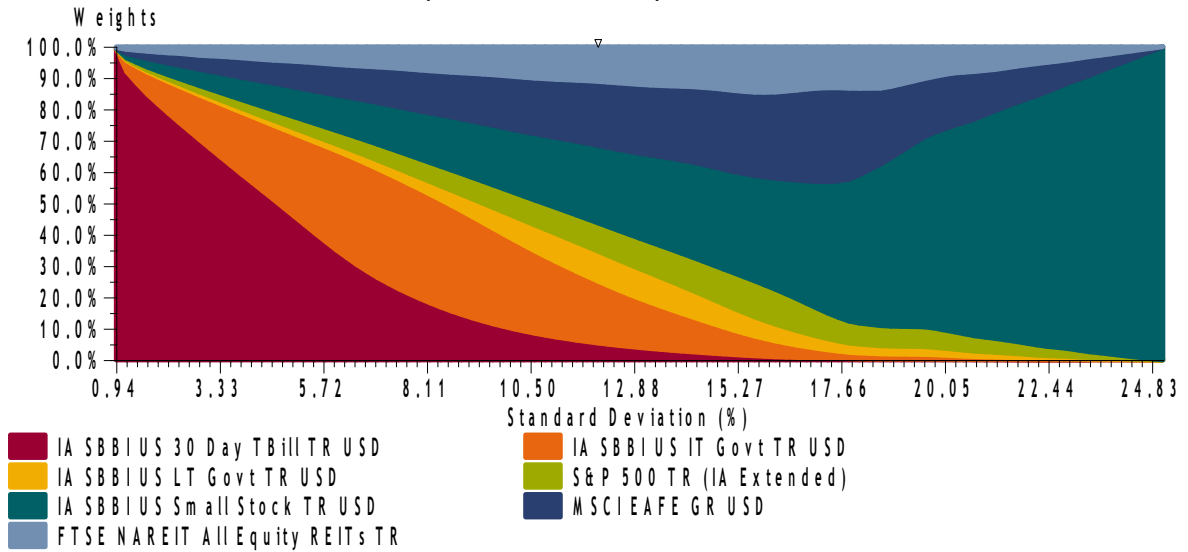
Optimization Inputs Summary - Base Case										
	Expected Return	Standard Deviation	Correlation with IA SBBI US 30 Day TBill TR USD	Correlation with IA SBBI US IT Govt TR USD	Correlation with IA SBBI US LT Govt TR USD	Correlation with S&P 500 TR (IA Extended)	Correlation with IA SBBI US Small Stock TR USD	Correlation with MSCI EAFE GR USD	Correlation with FTSE NAREIT All Equity REITs TR	Correlation with London Fix Gold PM PR USD
IA SBBI US 30 Day TBill TR USD	2.6	0.942	1	0.158	0.059	-0.002	-0.035	-0.025	-0.043	-0.073
IA SBBI US IT Govt TR USD	3.9	5.977	0.158	1	0.848	0.097	-0.02	0.049	0.032	0.032
IA SBBI US LT Govt TR USD	4.3	11.651	0.059	0.848	1	0.161	0.042	0.089	0.084	0.024
S&P 500 TR (IA Extended)	10.3	17.367	-0.002	0.097	0.161	1	0.753	0.621	0.57	-0.018
IA SBBI US Small Stock TR USD	15.2	25.07	-0.035	-0.02	0.042	0.753	1	0.501	0.632	-0.02
MSCI EAFE GR USD	10.7	19.47	-0.025	0.049	0.089	0.621	0.501	1	0.448	0.18
FTSE NAREIT All Equity REITs TR	10.3	19.572	-0.043	0.032	0.084	0.57	0.632	0.448	1	0.017
London Fix Gold PM PR USD	4.6	22.988	-0.073	0.032	0.024	-0.018	-0.02	0.18	0.017	1

Note: The expected return is an arithmetic mean. Where necessary, geometric averages have been converted into arithmetic averages by adding one-half of the variance to the geometric mean. The FTSE NAREIT standard deviation and correlation numbers commence January, 1972 and not September 1971.

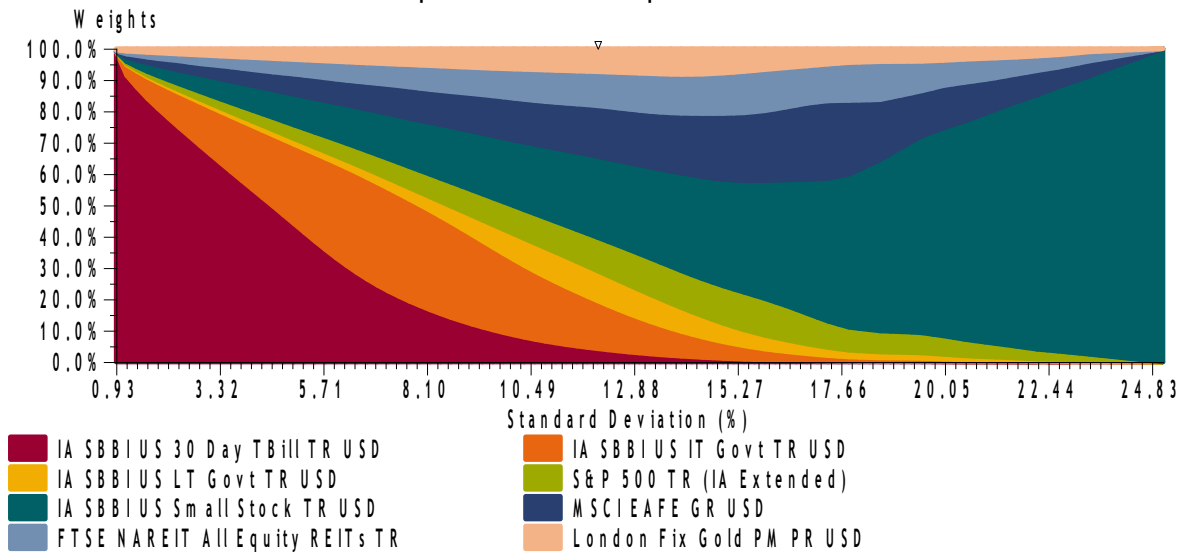


Appendix III

Frontier Area Graph - Base Optimization w/o Gold



Frontier Area Graph - Base Optimization with Gold





Tacita Capital Inc. (“Tacita”) is a private, independent family office and investment counselling firm that specializes in providing integrated wealth advisory and portfolio management services to families of affluence. We understand the challenges of affluence and apply the leading research and best practices of top financial academics and industry practitioners in assisting our clients reach their goals.

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ⁱ Real long-term government bond yields have been calculated by deducting the 12-month Ibbotson Inflation Rate from the monthly Ibbotson Long-Term Government Bond Yield.

ⁱⁱ Siegel, Jeremy J., *Stocks for the Long Run: The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies*, Fourth Edition, 2008, McGraw Hill.